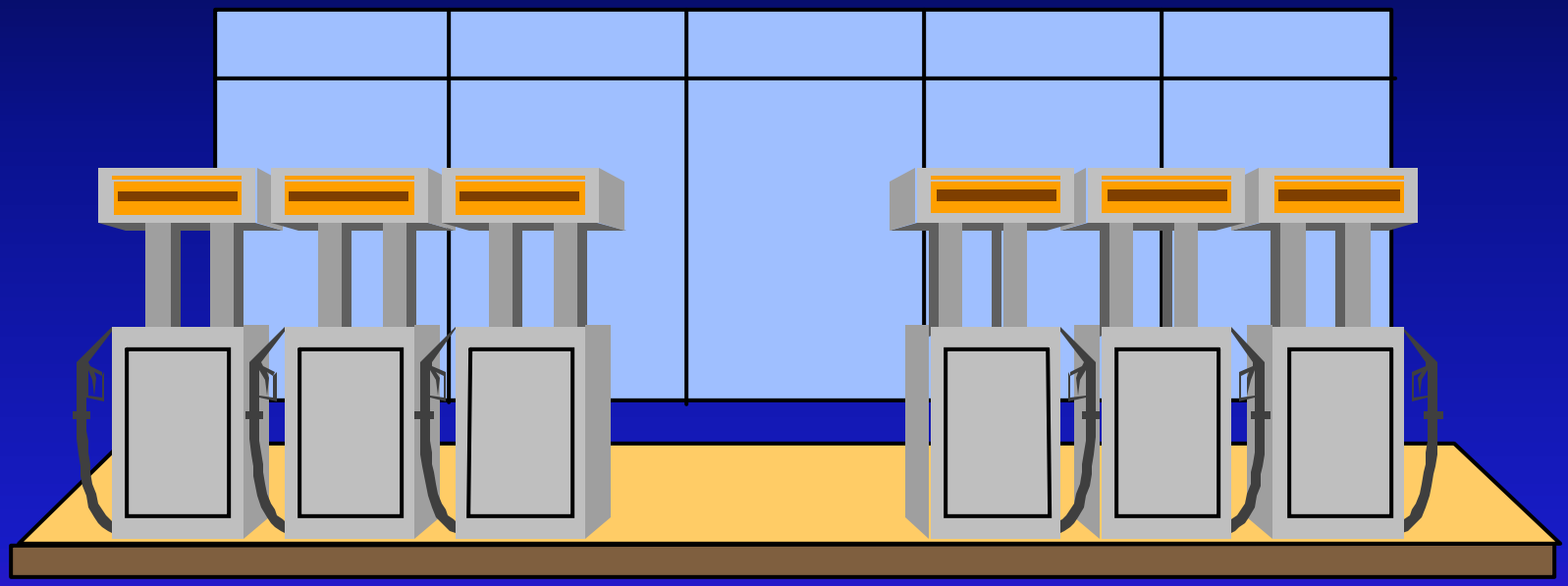
# ENHANCED VAPOR RECOVERY

July 13, 2000

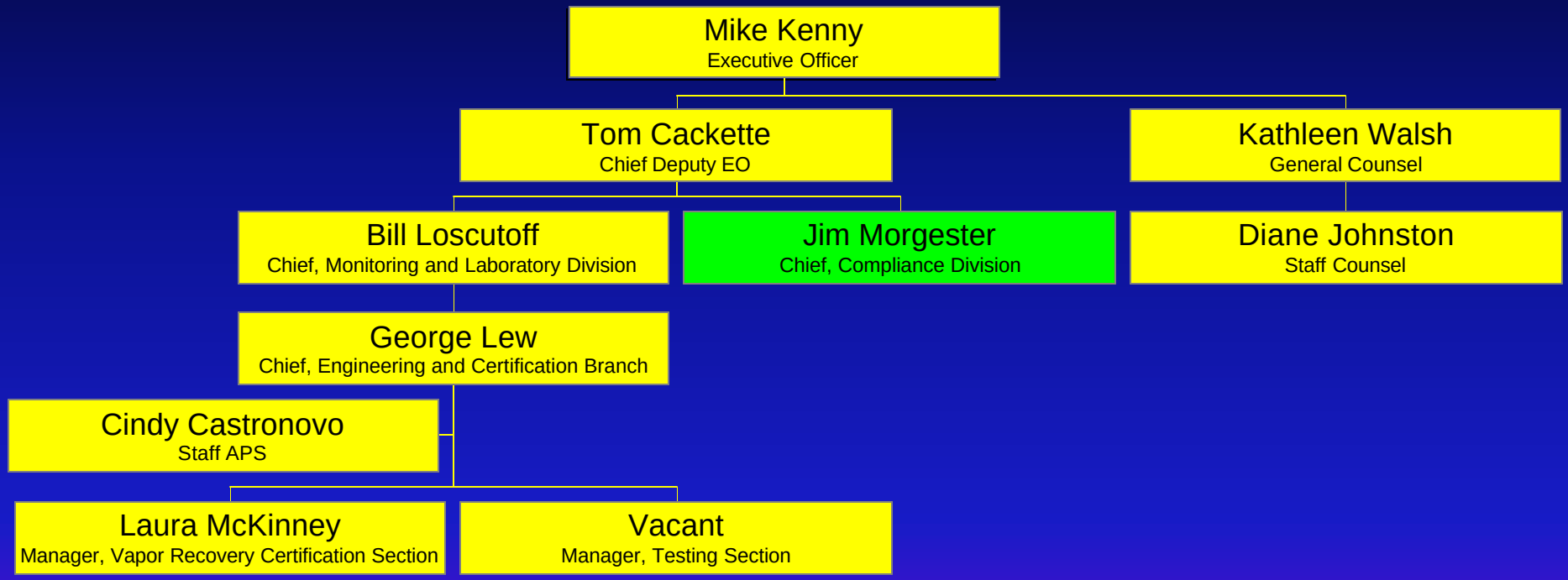


California Environmental Protection Agency

Air Resources Board

www.arb.ca.gov/vapor/evr/evr.htm

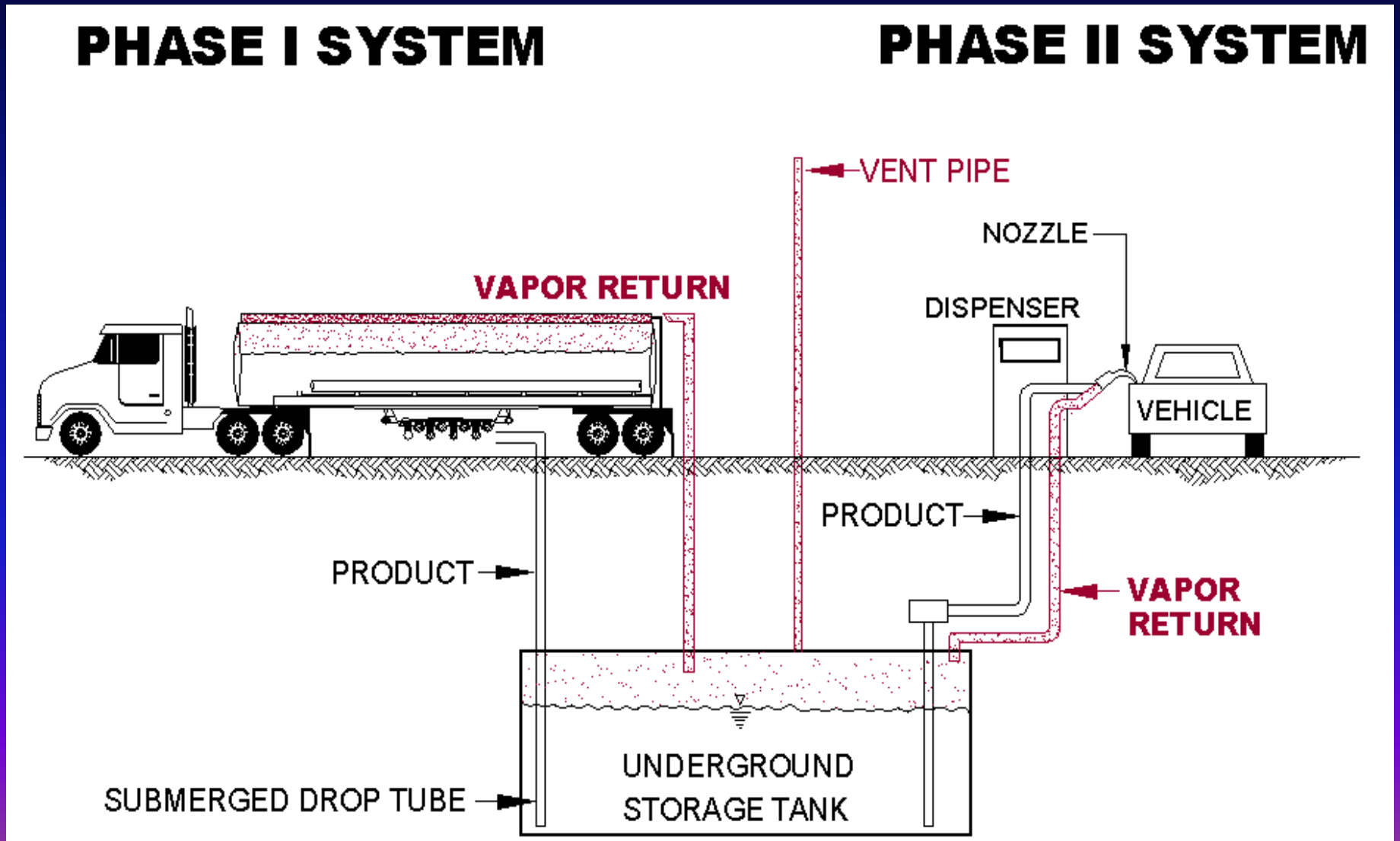
# CARB Vapor Recovery Program Organization



# Outline

- Background
- Vapor Recovery Program History
- EVR Overview
- Technology Review
- Regulatory Schedule
- EVR Implementation

# CA Phase I and Phase II Vapor Recovery = USEPA Stage 1 and Stage 2




# CA Air Pollution Control Districts

# CAPCOA Committees

- CAPCOA = California Air Pollution Control Officers Association
- CAPCOA Vapor Recovery Technical Committee
- CAPCOA Enforcement Managers

# Vapor Recovery Historical Highlights

## 1972 & 1973

Bay Area & San Diego require Phase I & II

## 1974

California Health & Safety Code 41954

- performance standards which are reasonable and necessary to achieve or maintain ambient air quality standard
- CARB shall certify that gasoline vapor control systems meet standards

# Historical Highlights (continued)

1976

CARB adopts certification procedures

1981

First spitback & spillage performance standards

1985

CA Air Toxics Control Measure

State law to reduce benzene exposure

# Historical Highlights (continued)

## 1990

Federal Clean Air Act Amendments

Stage 2 (Gas Station) Vapor Recovery ***AND*** Onboard Refueling Vapor Recovery (ORVR)

- specify CARB-certified equipment
- establish certification program using CARB certification and test procedures
- establish certification and test procedures which are approved by EPA as equivalent to CARB's

# Historical Highlights (continued)

## 1996

CARB amends certification and test procedures

New specifications, but no new standards, did not trigger recertification

## 2000

CARB “approves” Enhanced Vapor Recovery

Numerous new standards and changes to certification process

EVR in rulemaking process - not yet “adopted”

# Volume 2: Certification and Test Procedures for Gasoline Vapor Recovery Systems

- CP = Certification Procedure
- TP = Test Procedure
  - 201: Gasoline Dispensing Facility
  - 202: Bulk Plants
  - 203: Terminals
  - 204: Cargo Tanks
  - 205: Novel Facilities

# Units for Primary Performance Standards

- Emission Limit:

  lbs/1000 Gallons (controlled)

- Efficiency:

  % (controlled/uncontrolled)

# ARB and District Roles in California's Vapor Recovery Program

- ARB develops procedures
- ARB certifies systems
- Districts adopt rules
- Districts permit systems and conduct compliance inspections

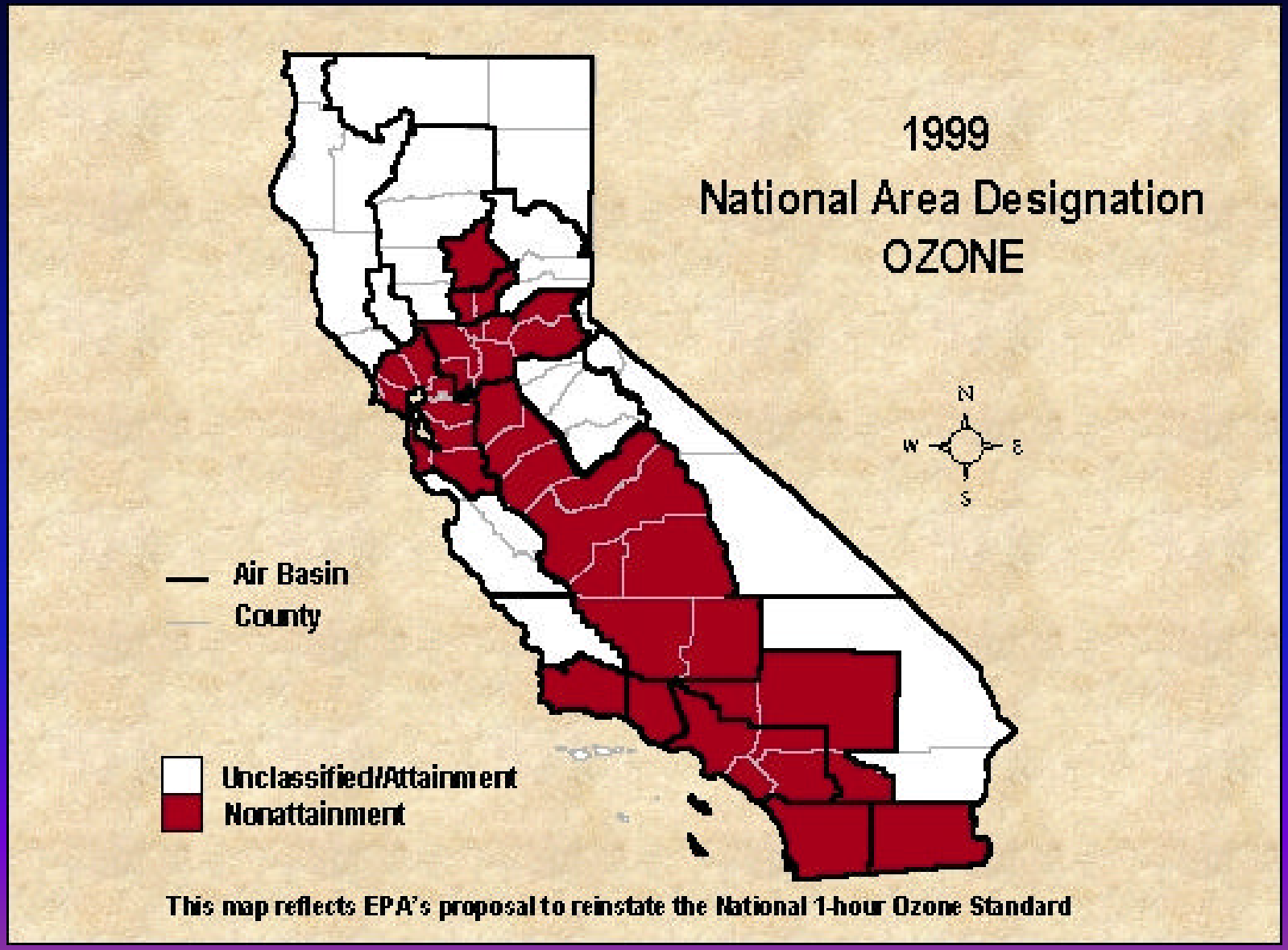
# CARB Certification Process for Phase 1 and Phase II Systems

- Application by equipment manufacturer
- Install equipment at test site
- Periodic testing during operational test
  - currently 90 days minimum
- Emission test for primary standard
  - currently 100-car test for efficiency
- Approval from CalOSHA, SFM, DMS
- Draft Executive Order for district review
- Issue Executive Order

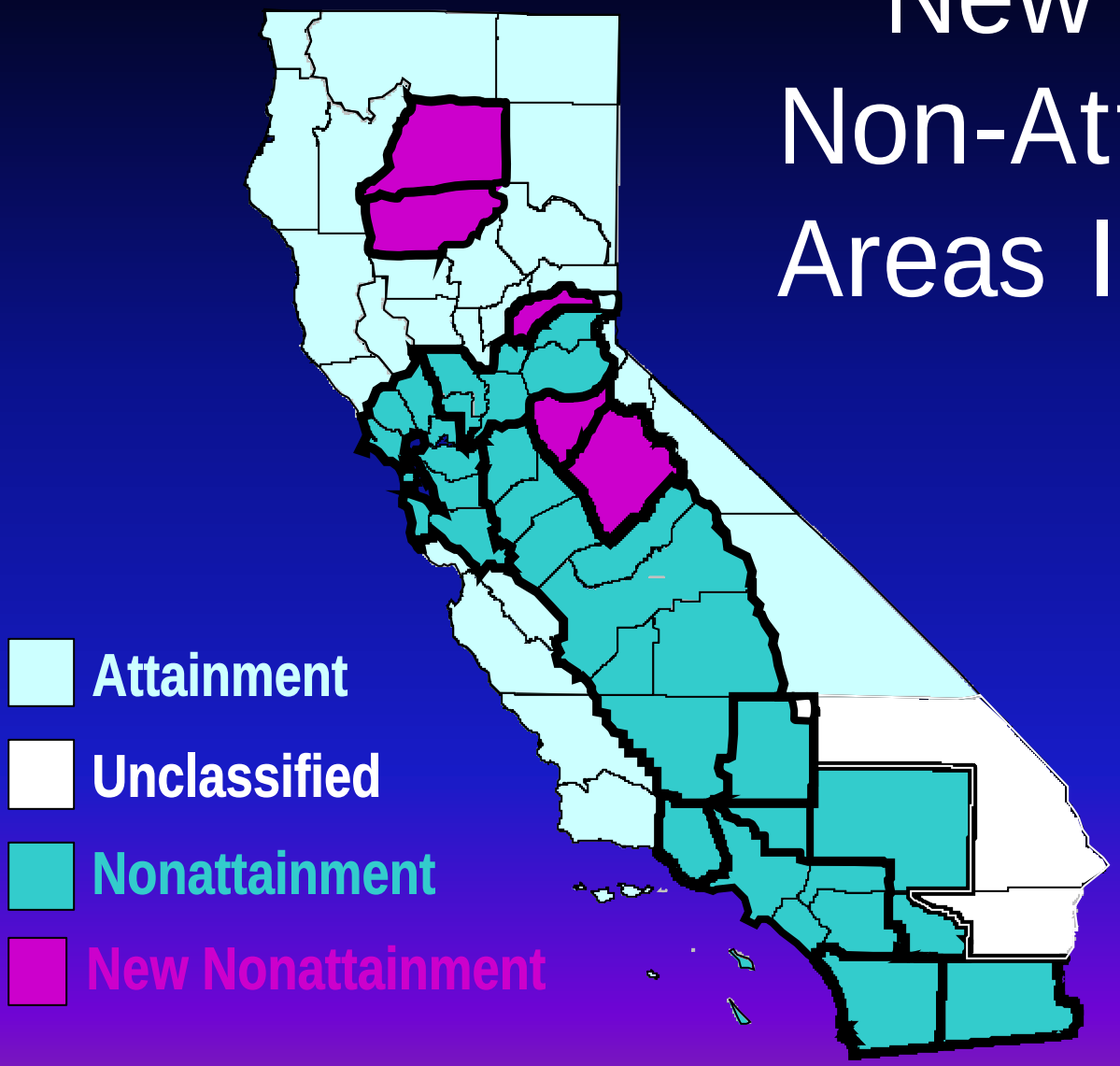
# Executive Orders and Approval Letters

- Executive Orders (EOs) describe equipment allowed for certified system
  - May dictate operational constraints
  - May include testing requirements
- Approval letters provide updates to Executive Orders
  - add allowable equipment
- Approval letters not anticipated for EVR

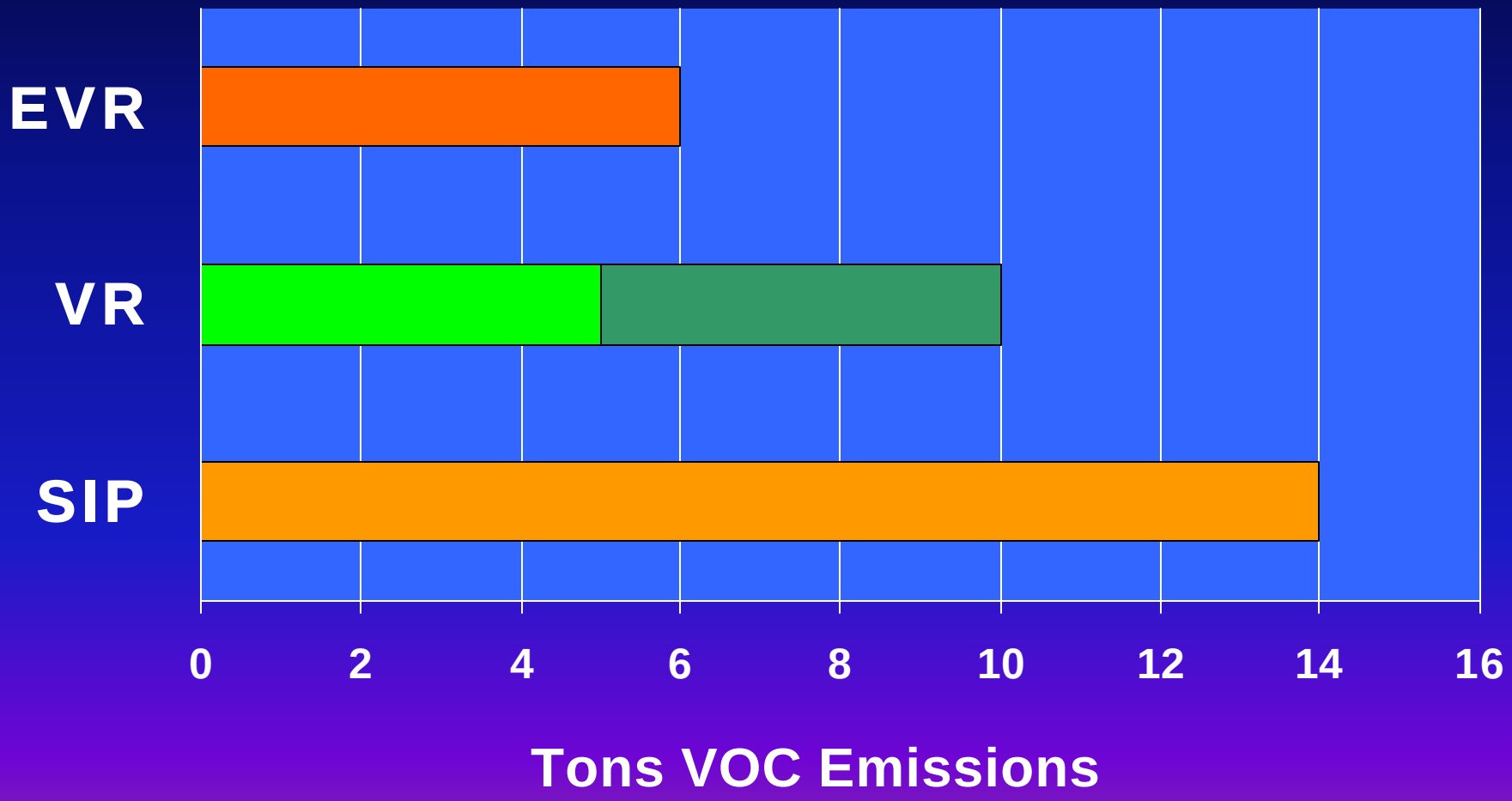
# California Exceeds Ozone Standards



# New Ozone Non-Attainment Areas Identified



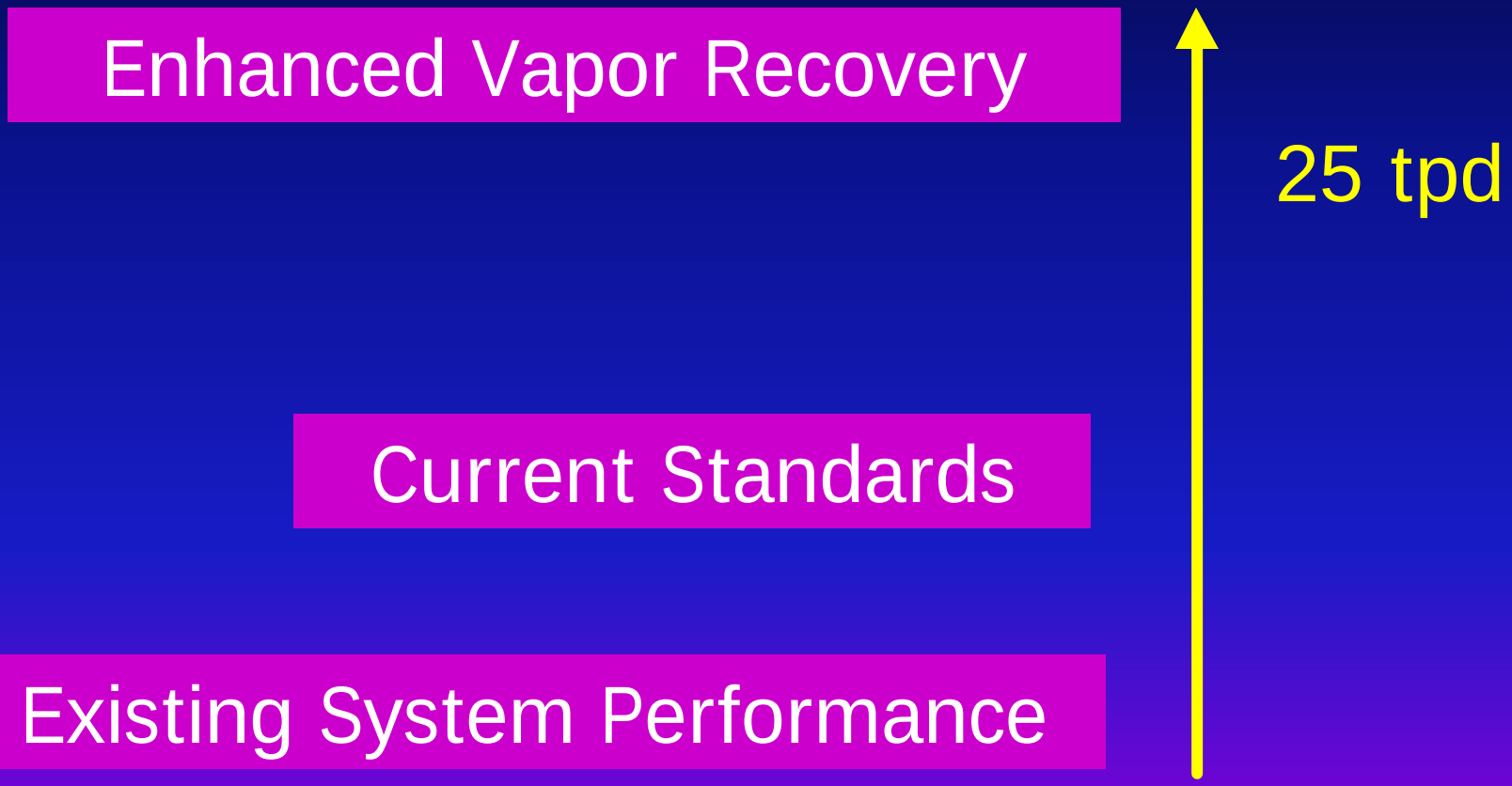
# SIP Lawsuit Agreement



# CAPCOA/ARB Field Inspections

- Inspections in six districts
  - 1600 assist nozzles
  - 1000 balance nozzles
  - 280 drop tubes
- Results
  - 11VAI aluminum spout off the market
  - VST hoses fixed and replaced
  - 11VAI vapor path resolved
  - curley-Q problem fixed

# EVR Improves Existing Systems and Goes Beyond Today's Standards



# EVR Goals and Strategy

## Goals

- Increase in-use performance of service station vapor recovery systems
- Additional emission reductions

## Strategy

- Fix existing problems (short-term)
- EVR proposal (long-term)

# Activities Addressing Currently Installed Systems in CA

- Parts houses enforcement
- Maintenance manuals
- Considering decertification of some problem equipment
- Simple inspection procedures

# Summary of the EVR Amendments

Module 1: Phase I vapor recovery

Module 2: Phase II vapor recovery

Module 3: ORVR compatibility

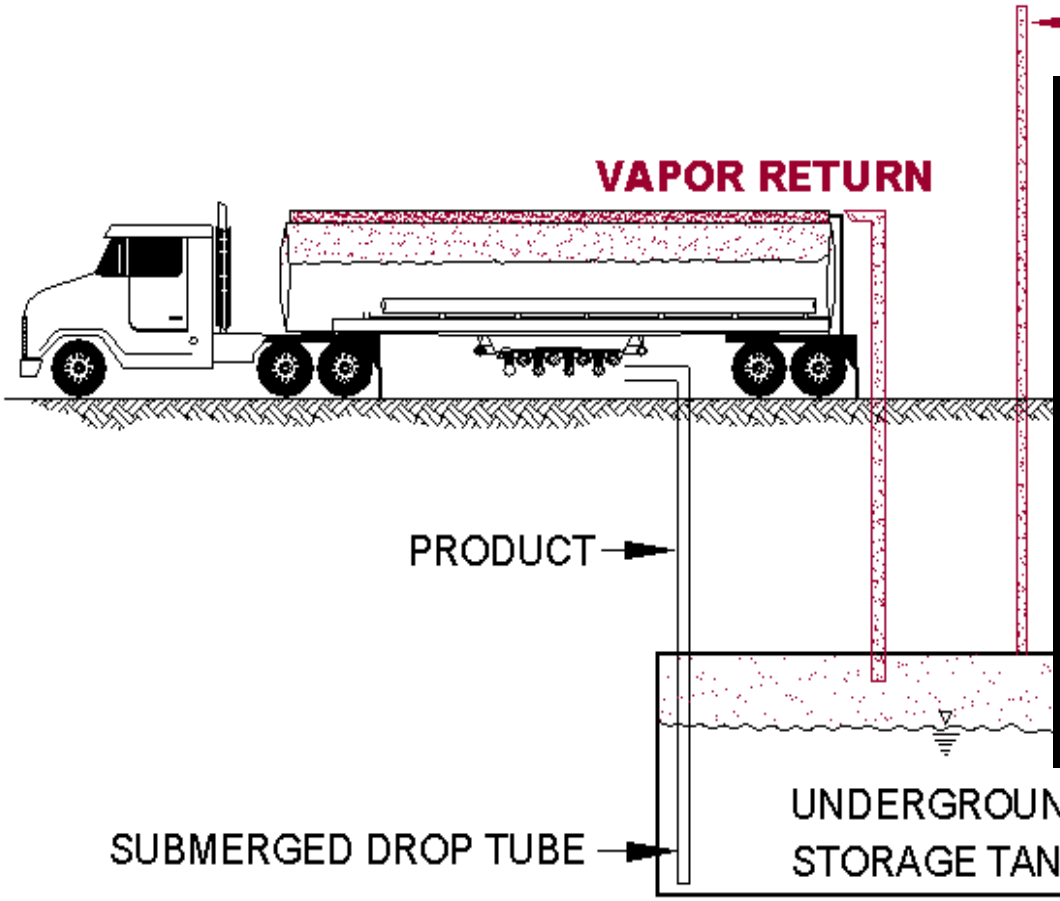
Module 4: Liquid retention and spitback

Module 5: Spillage and dripless nozzles

Module 6: In-Station diagnostics

Certification Changes

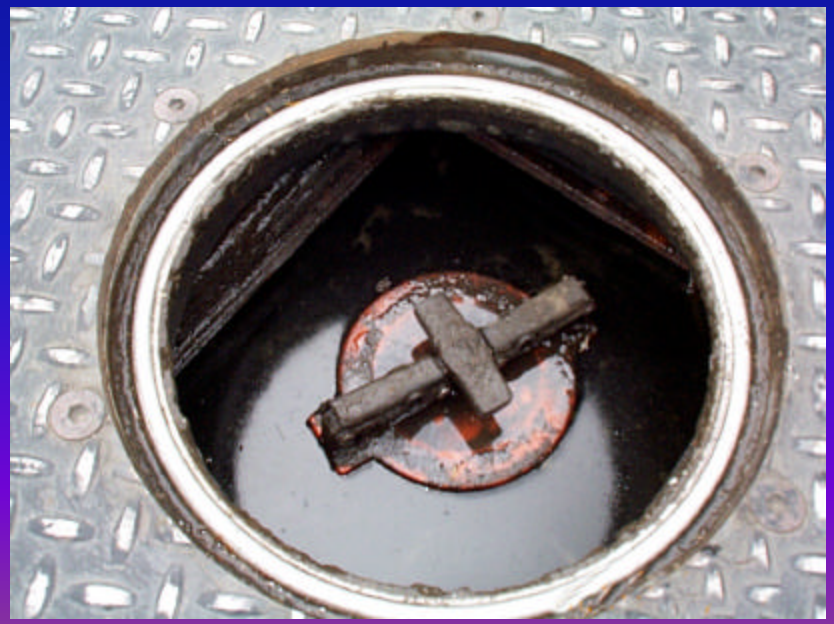
# Phase I Vapor Recovery




- Droptubes
- Containment boxes
- Product and Liquid Adaptors (Hose Connectors)
- Vent Pipe Valves

# Module 1
# Phase I Vapor Recovery

- Increase Phase I transfer efficiency from 95% to 98%
- Improve equipment components
  - P/V valves
  - Phase I fittings
  - drain valves

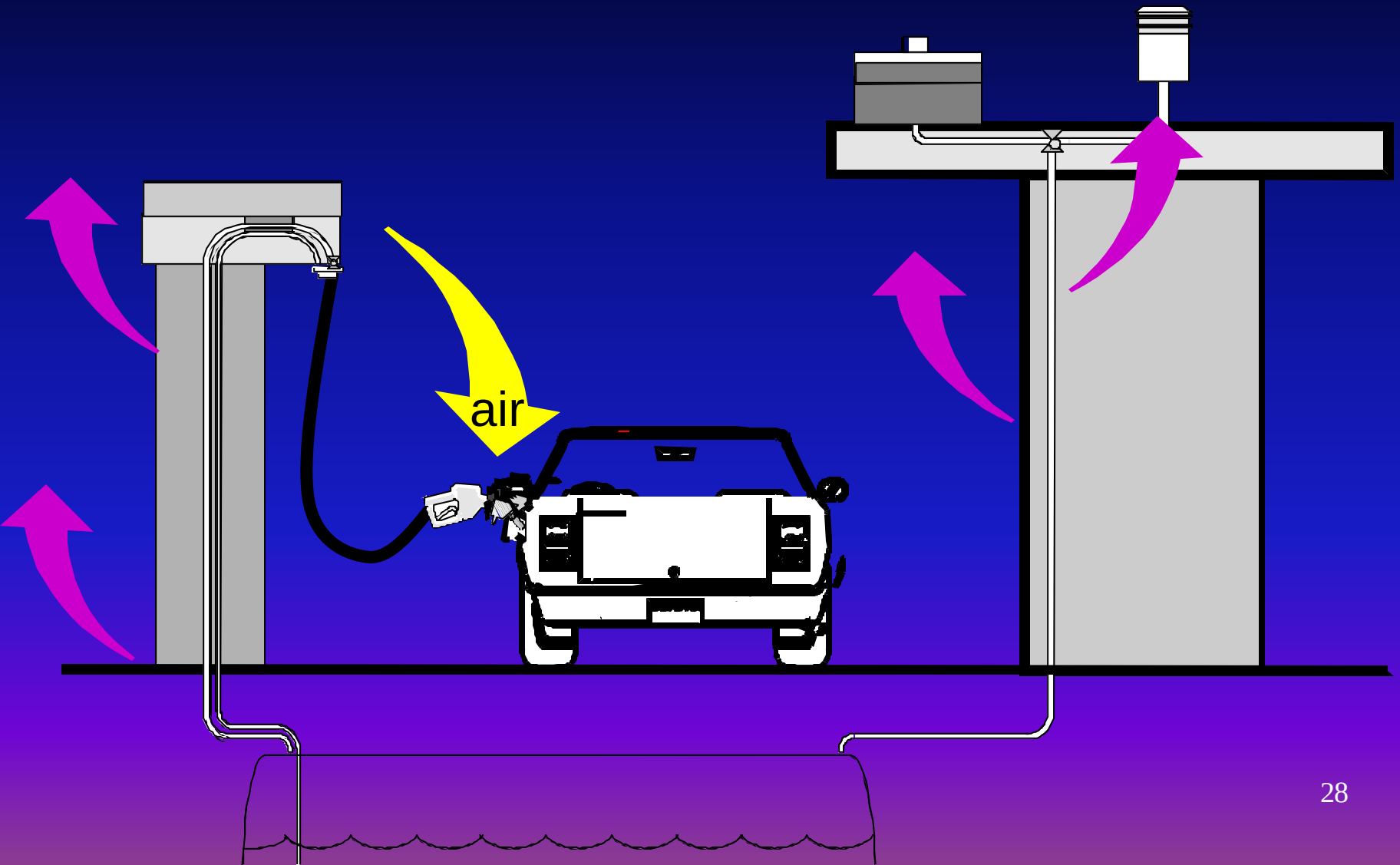


# Module 2 Phase II Vapor Recovery

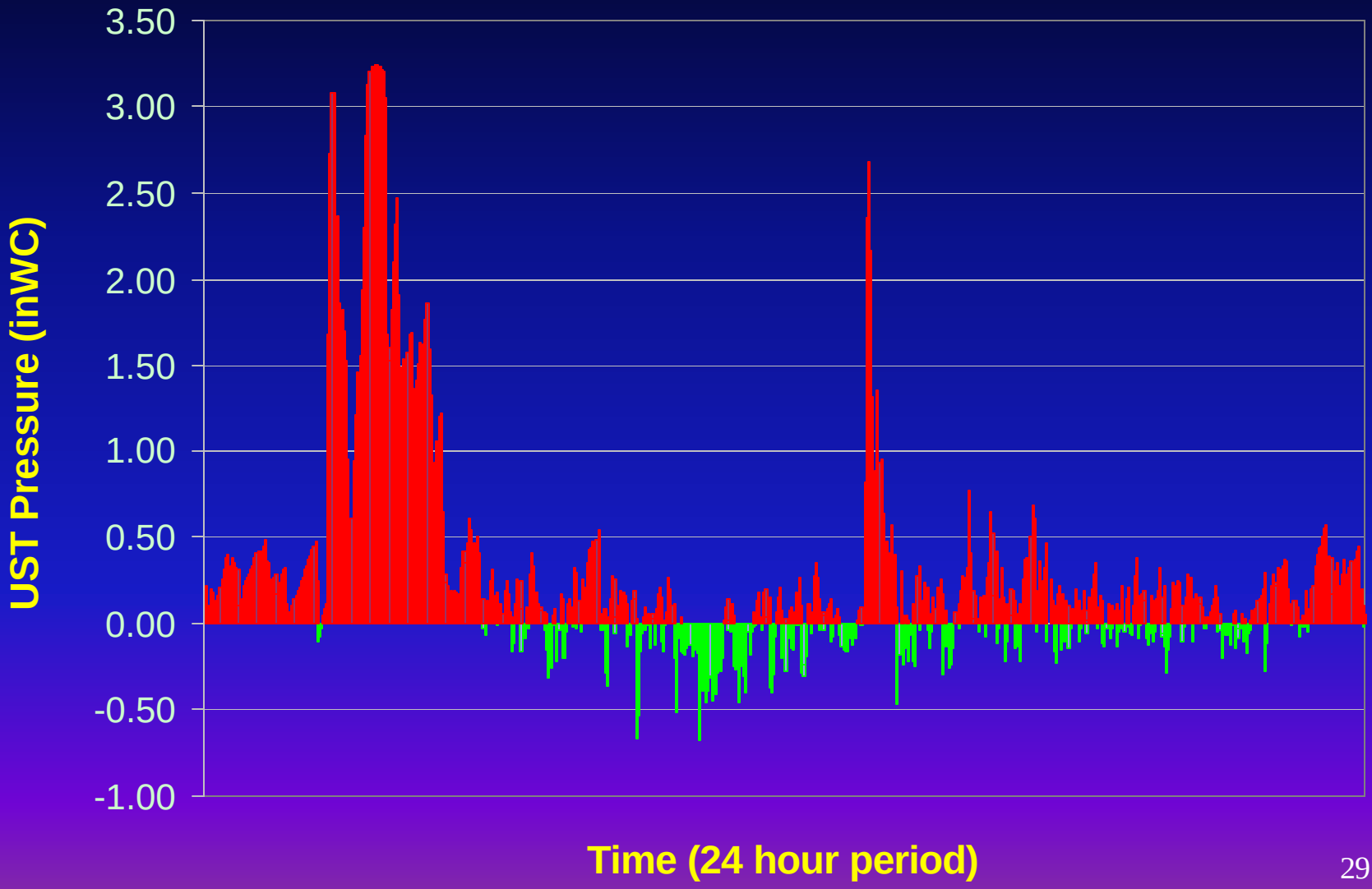
- Numerous significant changes to certification process and standards
  - pressure-related fugitives
  - storage tank pressure limits
  - emission factor
  - component specifications
  - vapor processors

# Phase II
# Balance and Assist Nozzles

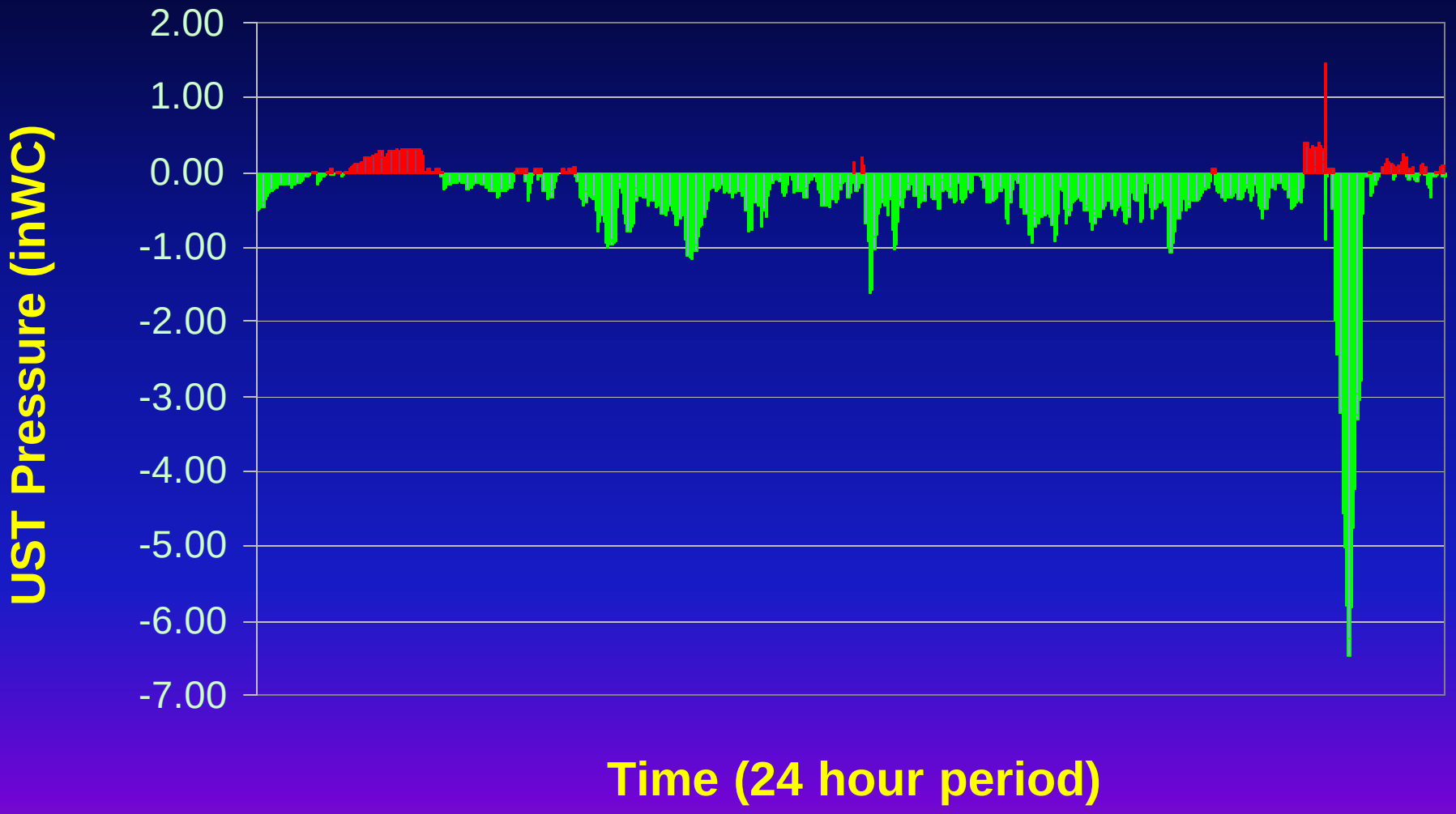
# Pressure-Related Fugitives



# Pressure Data from Balance Station (as found)



# Pressure Data from Balance Station (tight system)



# Underground Storage Tank Pressure Monitoring

- Proposed limits would allow slight positive pressures
  - hourly high pressure less than 1.5 in water
  - 30-day average less than 0.25 in water
- Signal when exessive leaks occur
  - atmospheric pressure for extended periods
- Exclude periods after bulk drop

# Efficiency vs. Emission Limit

- Current
  - State: 90% efficiency, districts 95%
- Original EVR Proposal
  - change from 90% to 0.38 lbs/1000 gallons
- Amended EVR Proposal
  - Summer Certification Testing
    - 0.38 lbs/1000 gallons **AND** 95% efficiency
  - Winter Certification Testing
    - 0.38 lbs/1000 gallons **OR** 95% efficiency

# New Component Standards

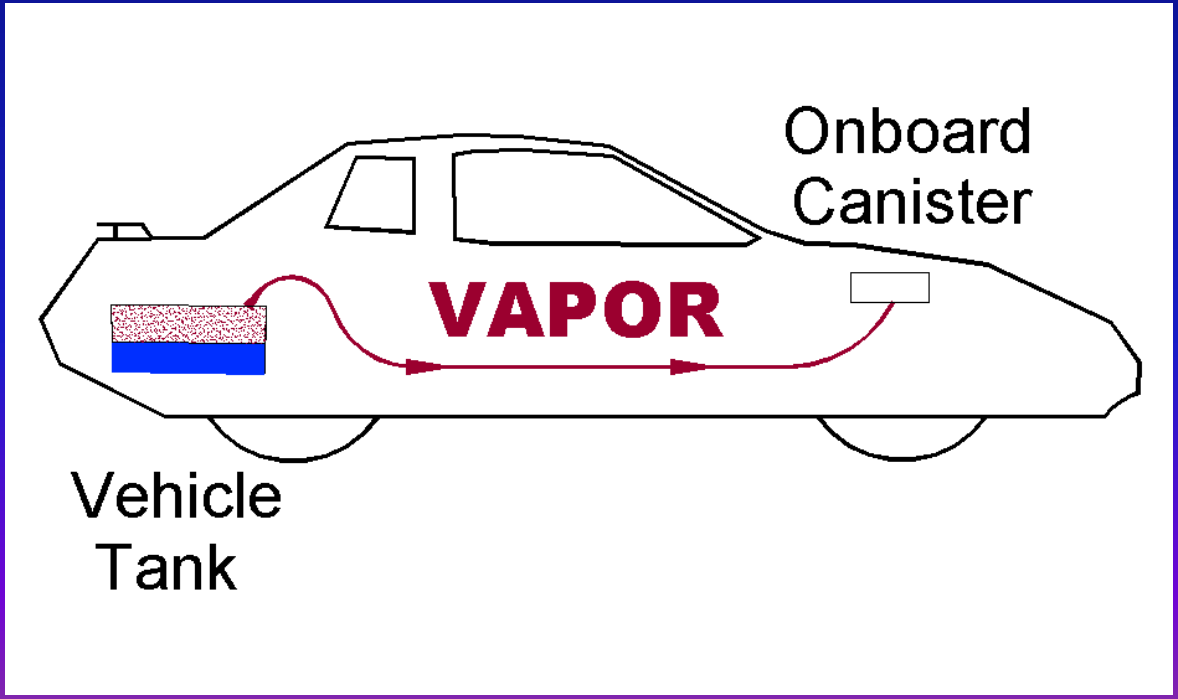
- Pressure drop budget for balance system components
- Vapor check valves
- Unihose dispenser


# Air Pollutant Emissions from Processors

- All Processors
  - max HC rate < 3.8 lb/1000 gal
  - benzene < 7.2 lbs/year
- Destructive Processors
  - 1,3-butadiene < 1.2 lbs/year
  - formaldehyde < 36 lbs/year
  - acetaldehyde < 84 lbs/year
- Affected Certifications
  - Hirt, Hasstech

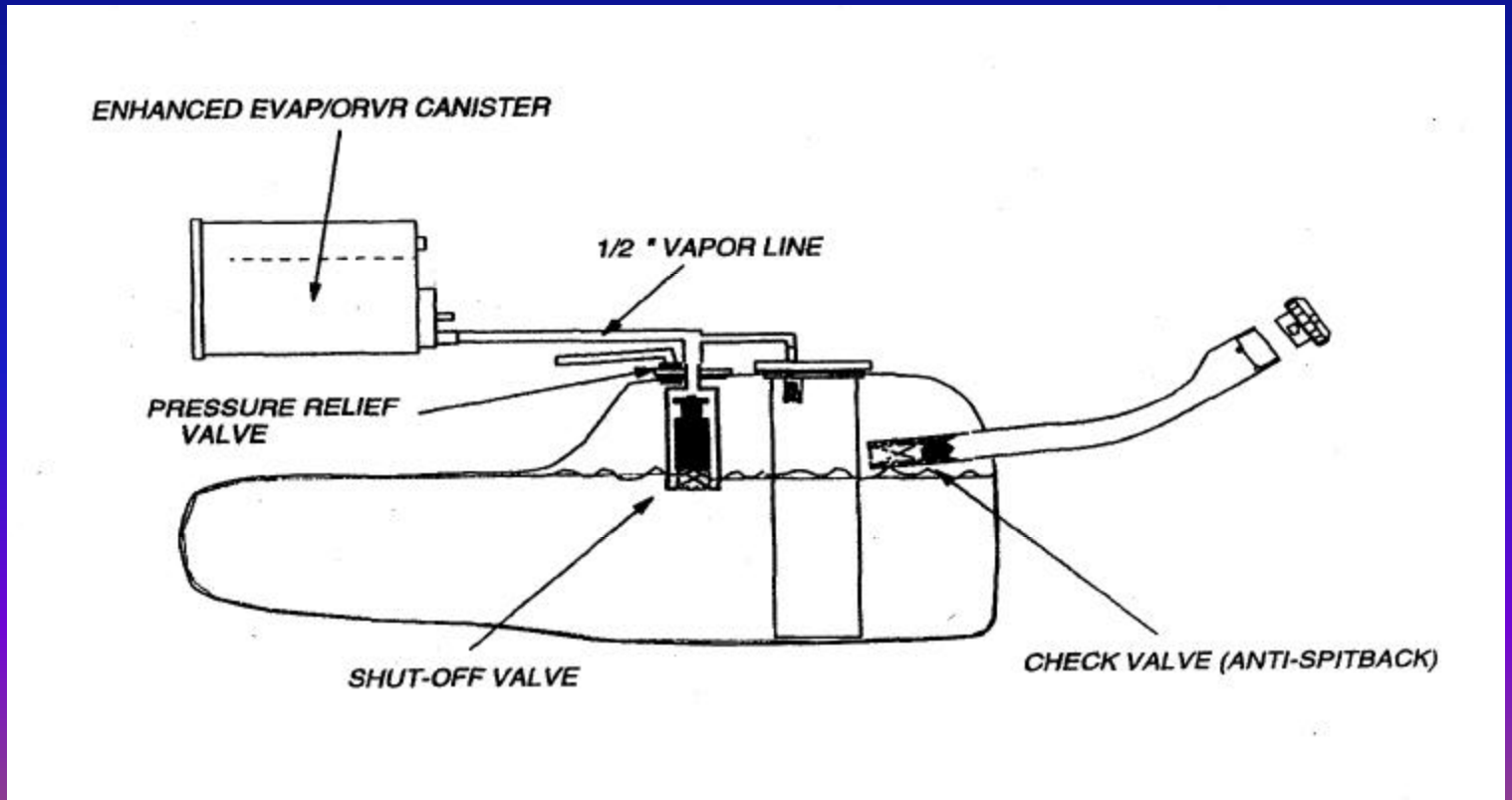
# Module 3: ORVR Compatibility

- ORVR = Onboard Refueling Vapor Recovery
- Federal requirement

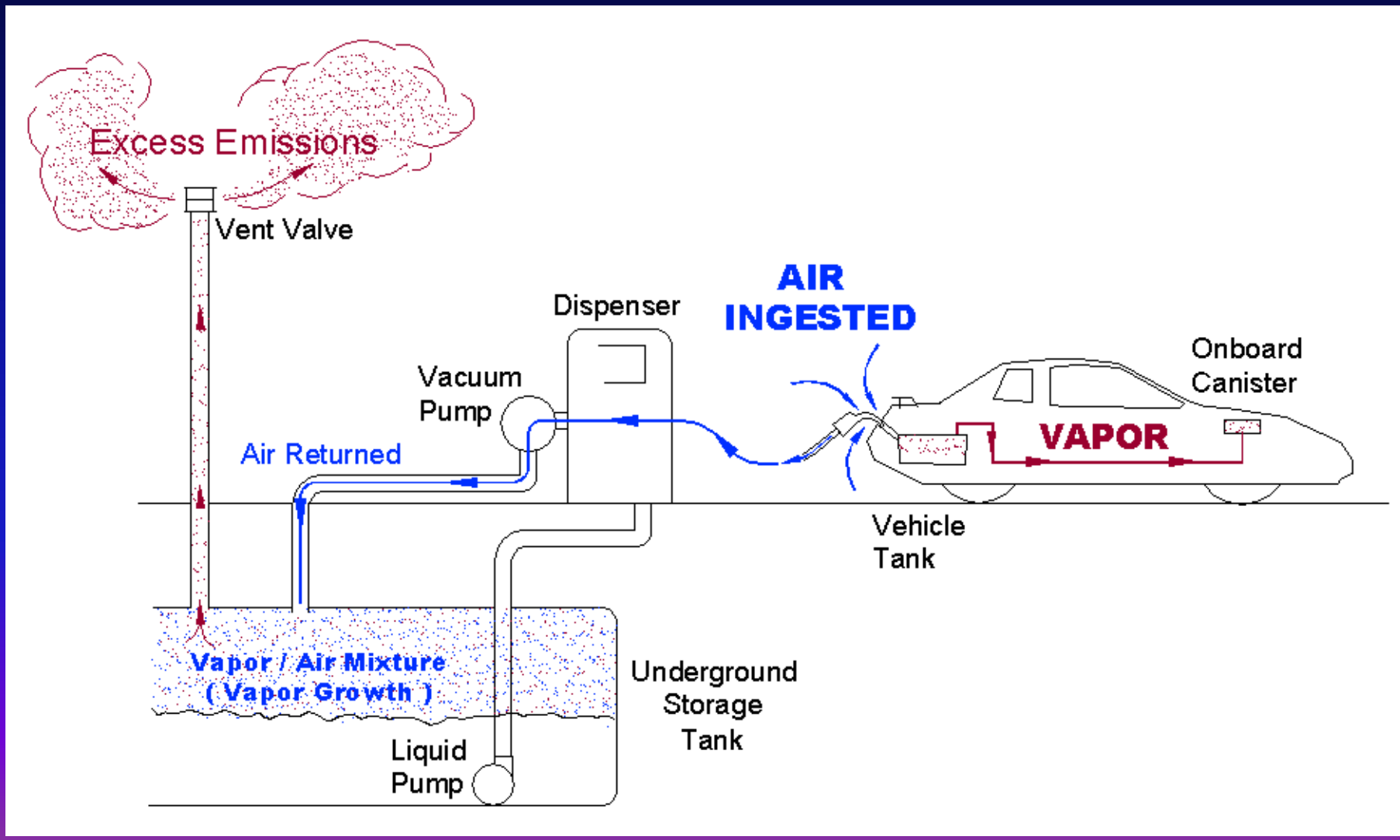


# How ORVR Works

- Vapors prevented from escaping at fillneck：
  - Liquid seal - narrow fillpipe
  - Mechanical seal - gasket near fueling point



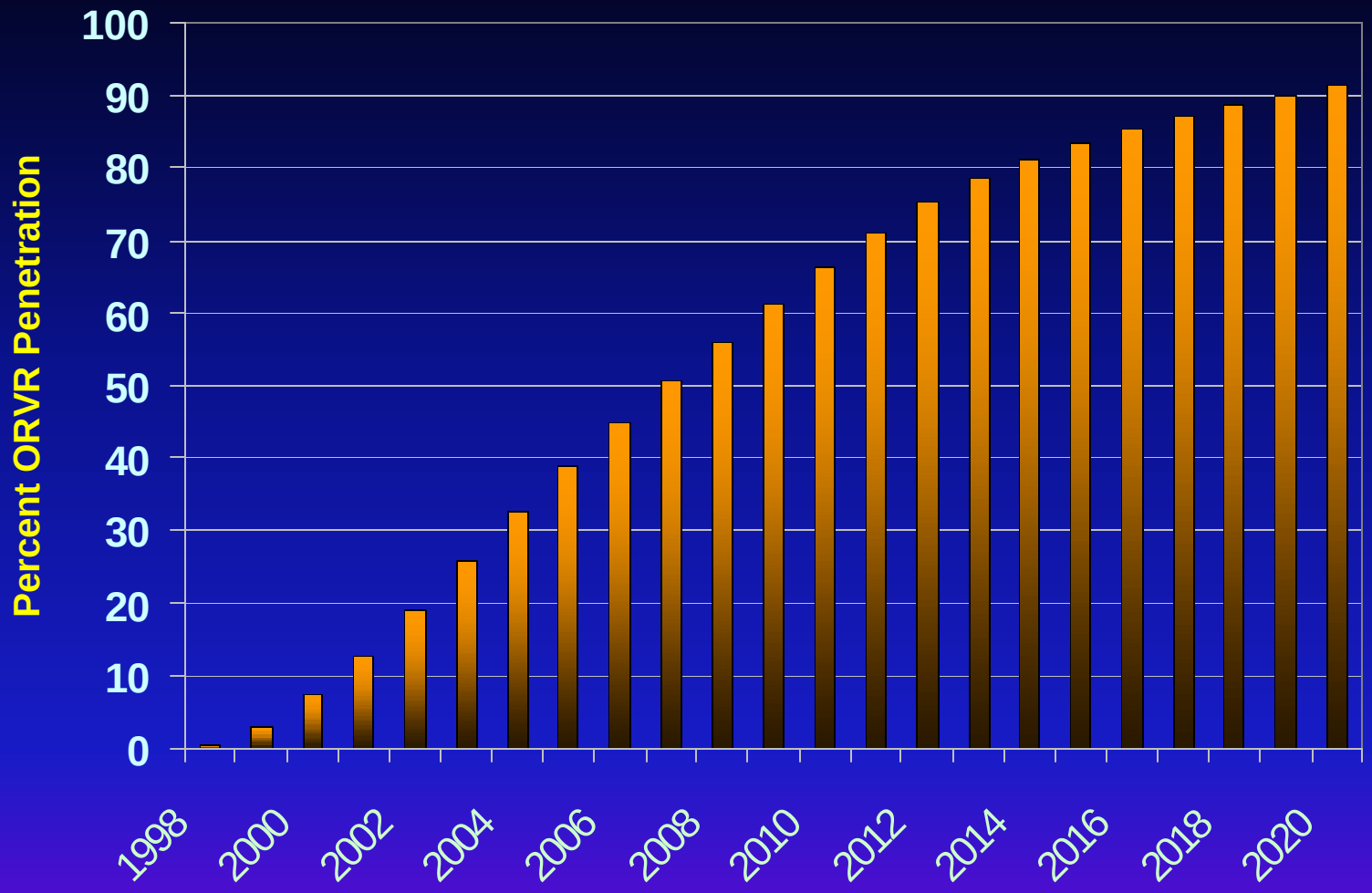
# ORVR/Phase II Compatibility



# ORVR Phase-in

| Vehicle Class | 40% | 80% | 100% |
|---|---|---|---|
| Passenger | 1998 | 1999 | 2000 |
| LD Trucks & MDV (<6000 lbs) | 2001 | 2002 | 2003 |
| MD Vehicles (6001-8500 lbs) | 2004 | 2005 | 2006 |

# ORVR Penetration Projection for CA




- In 2010, about 66% of gasoline throughput in CA will be dispensed to ORVR vehicles

# Module 3 - ORVR Compatibility

- Require Phase II to have no excess emissions for ORVR fuelings
- Test to be proposed by applicant

# Module 4 - Liquid Retention and Nozzle Spitting

- New emission category
- Liquid evaporates from hanging hardware between fuelings
- Expected to be technology-forcing
- Proposed phase-in of limits
  - first limit based on better nozzles
- spitting < 1.0 ml/nozzle

# Module 5
# Spillage & Dripless Nozzle

- More stringent spillage standard
  - reduce from 0.42 to 0.24 lbs/1000 gal
  - add criteria to limit drips from nozzles after fueling
- Technology forcing

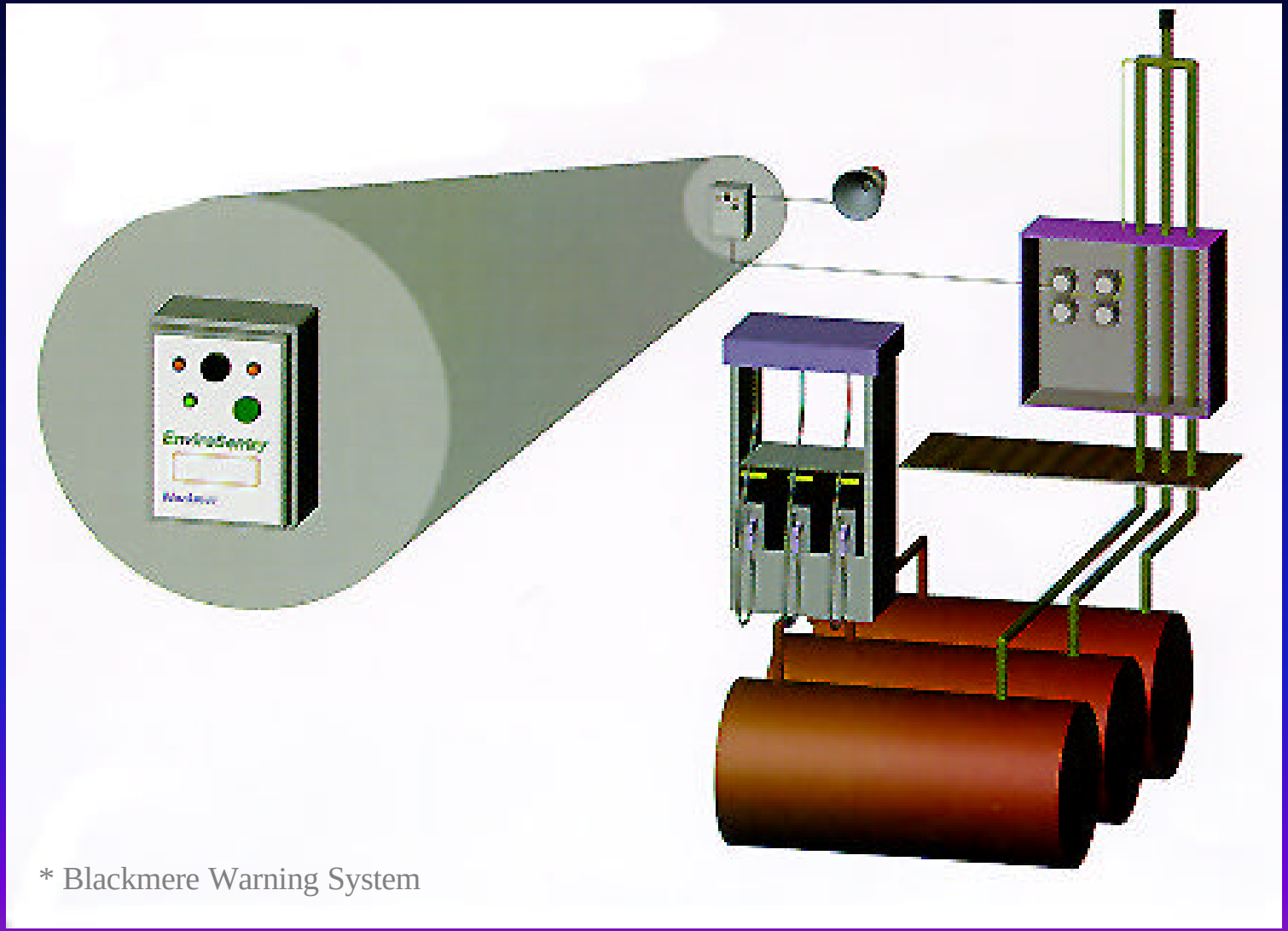
# Module 6 - In-Station Diagnostics

- Current systems can dispense fuel even if vapor recovery not working
- Identify failure modes automatically
- Supplement district inspections
- Concept similar to OBD for vehicles
- Tie-in to existing UST leak monitors

# Module 6 - In-Station Diagnostics

- All systems: pressure monitoring
- Balance system
  - blockage in vapor return line
- Assist system
  - vapor pump failure
- Assist systems with processors
  - processor operation

# In-Station Diagnostics



* Blackmere Warning System

# Certification Changes

- Application
  - maintenance manuals, test data
  - plan for installer training
- Testing
  - field evaluation increased to 180 days min
  - test matrix increased to 200 cars
- District review
  - application and draft Executive Orders

# Component Certification

- State law says certify systems
- Test burden for components which can be used on multiple systems
- Non-system specific components
  - full testing on one system
  - reduced testing on subsequent systems
- System-specific components
  - full testing per system still required

# Warranty Changes

- Additions to warranty tag
  - factory tested statement
  - list of applicable performance standards and specifications
- Performance standards to be met throughout warranty period
- Warranty may be conditioned to use of trained installer

# Limited Term Certification

- No expiration date for existing systems
- Proposed 4-year limit
  - renew if no deficiencies identified
  - serious deficiency → decertification
  - minor deficiency → delay renewal
- Installed expired systems can be used for remainder of useful life up to 4 years

# New and Revised Test Procedures

- TP-201.2D Drips from Nozzles
- TP-201.2E Liquid Retention
- TP-201.2F Pressure-related Fugitives
- TP-201.2H Processor HAPs
- TP-201.2O Drop Tube Leaks
- Revisions for nine existing procedures for Phase I and Phase II certification
- Repeal of TP-201.3A 5 inch leak test

# State Law Requirements

- Change in standard triggers decertification
- Existing vapor recovery systems may be used for 4 years (4-year clock)
- Replacement parts must be certified
- New installations must meet new standards in effect at time of installation

# Technology Review

- Review feasibility for:
  - final liquid retention limit
  - dripless nozzle
  - in-station diagnostics
- Technology Review in 2002 (prior to affecting existing facilities)

# EVR Key Issues

- Decertification of all systems
- Recertification timing
- In-Station Diagnostics
- Impact on Small Business
- Transfer of Certification

# Decertification of All Systems

- New standard triggers decertification
  - Affects existing installations in 4 years
  - Affects other states
- Comment
  - Improving existing systems will get emission benefits sooner
- Response
  - Will delay some EVR effective dates if other parts of EVR are implemented earlier than originally proposed

# Recertification of all systems

- Comment
  - Effective date of April 2001 does not provide time to recertify systems:
    - new application data requirements
    - extension from 90 to 180 days minimum
    - extension from 100 to 200 car test
- Response
  - Provided more time to certify Phase II

# In-Station Diagnostics

Comment:

- Great concept - but should focus on improving systems, not monitoring
- ISD delay suggested

Response:

- Monitoring leads to improvements in durability and reliability, and
- Increased emission control
- Later effective dates allow ISD development

# Effect of Proposal Changes on Small Business

- Delay implementation up to 3 years
- Exempt low throughput stations
- Technology review

# Transfer of Certification

- Manufacturer responsible for system
- Transfer of certification to new company can lead loss of accountability
- Original proposal
  - certification expire upon date of transfer
- Amended proposal
  - certification expire normally, new company would need to recertify

# EVR Resolution Commitments

- Pilot program for equipment-reliability tracking - plan due October 1, 2000
- Early implementation of EVR Phase I on existing systems by April 2002
- Gilbarco VaporVac: lower A/L in combination with mini-boot nozzle
- ISD pilot program to generate data for 2002 Technology Review

# More Resolution Commitments

- Convene meeting and establish communication regulators from other states to discuss EVR
- Modify existing Executive Orders to authorize continued use of installed vapor recovery equipment as per CA H&SC 41956.1 (4 year clock)

# Future Activities

- Continue existing system improvements
- Certify equipment to new standards
- Establish expanded CAPCOA certification review process
- Technology Review 2002
- Refine emissions inventory
- Contractor training/licensing

# Rulemaking Schedule

- March 23, 2000 - CARB approved EVR proposal, however, staff must make changes made since February 4, 2000 available for comment
- August 2000 - Revised EVR proposal available for at least 15-day comment period.
- February 4, 2001 - Final EVR rulemaking package due to OAL
- April 1, 2001- First EVR Effective Date
- EVR Website: www.arb.ca.gov/vapor/evr/evr.htm

# California EVR Timeline